(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 371 386 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
17.12.2003 Bulletin 2003/51

(51) Int Cl.[7]: **A61M 31/00**

(21) Application number: **03013253.4**

(22) Date of filing: **12.06.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(30) Priority: **14.06.2002 US 172729**

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(54) Applicator device for suppositories and the like

(57) An applicator for delivering pharmaceutical products or the like to a bodily cavity includes a barrel member having a distal end which is equipped with an opening. The applicator also includes a plurality of petals extending outwardly from the distal end in a generally axial direction. The petals cooperate with the opening so as to form a receptacle for releasably receiving a pharmaceutical product in the distal end of the barrel member. Each of the petals has a truncated flexible tip sized and shaped so as to engage a substantially central portion of the pharmaceutical product such that a large section of the pharmaceutical product extends outwardly beyond the petals so as to facilitate the release of the pharmaceutical product from the receptacle. The device also includes a plunger member for releasing the pharmaceutical product from the receptacle. In accordance with the present invention, the device can be packaged in a package together with the pharmaceutical product received in the receptacle.

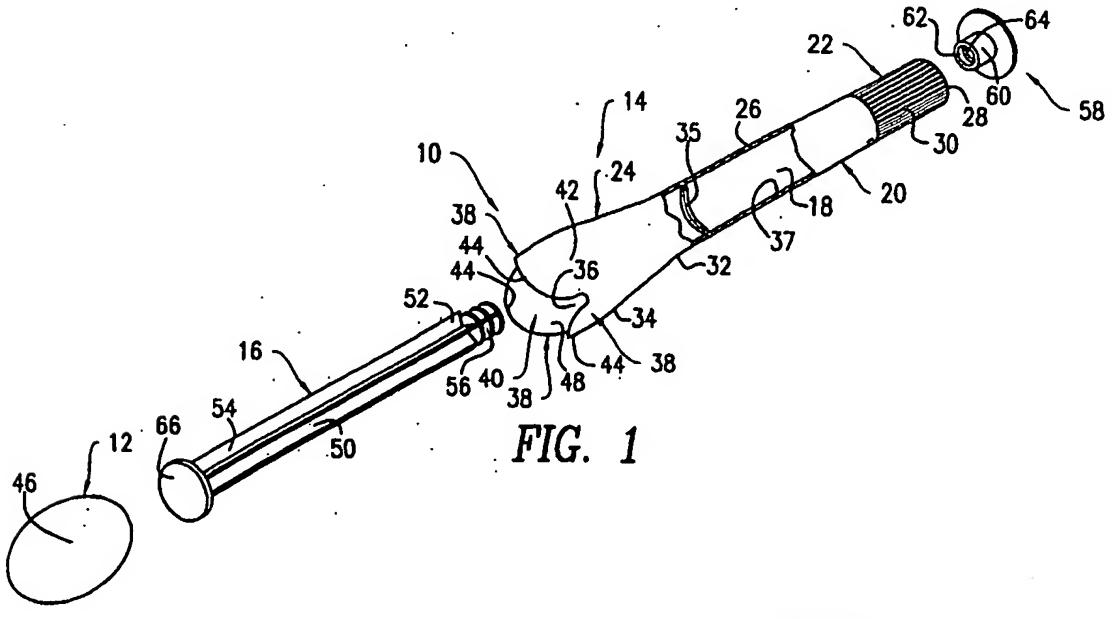

FIG. 1

EP 1 371 386 A2

Description

Cross-Reference to Related Application

[0001] This is a continuation-in-part of U.S. Patent Application Serial No. 10/172,729 filed June 14, 2002.

Field of the Invention

[0002] The present invention relates to applicator devices for suppositories and the like and, more particularly, to an applicator device adapted for depositing suppositories and the like in a bodily cavity or passage.

Background of the Invention

[0003] Suppository applicators have been in use for delivering suppositories to bodily cavities, such as vaginal canals and recta. Conventional applicators are equipped with barrel members for receiving suppositories and plunger members for expelling same from the barrel members. The barrel members have loading ends which are typically equipped with finger-like members or segments projecting therefrom for releasably attaching suppositories to the loading ends (see, for instance, U.S. Patent Nos. 2, 754, 822; 3,667,465; 3,934,584; 4,361,150; 5,201,779; 5,404,870; and 5,860,946). The finger-like members are sized such that, when suppositories are loaded onto the loading ends, they are enclosed substantially entirely by the finger like-members.

[0004] The applicators discussed above have various disadvantages. For instance, suppositories, when exposed to moisture, tend to stick to surfaces that are in contact therewith. In such circumstances, when the applicators are exposed to relatively high humidity, suppositories loaded therein tend to stick to the loading ends of the applicators. Because the suppositories are enclosed substantially entirely by the finger-like members, they have a relatively large area of contact with the loading ends of the applicators. As a result, when the suppositories stick to the applicators during storage or use, it becomes difficult to expel same from the applicators.

Summary of the Invention

[0005] The present invention overcomes the disadvantages and shortcomings discussed above by providing an improved applicator device for delivering pharmaceutical products or the like to a bodily cavity. More particularly, the device includes a barrel member having a distal end which is equipped with an opening. The applicator also includes a plurality of petals extending outwardly from the distal end in a generally axial direction. The petals cooperate with the opening so as to form a receptacle for releasably receiving a pharmaceutical product in the distal end of the barrel member. Each of the petals has a truncated flexible tip sized and shaped so as to engage a substantially central portion of the pharmaceutical product such that a large section of the pharmaceutical product extends outwardly beyond the petals so as to facilitate the release of the pharmaceutical product from the receptacle. The device also includes a plunger member for releasing the pharmaceutical product from the receptacle. In accordance with the present invention, the device can be packaged in a package together with the pharmaceutical product received in the receptacle.

Brief Description of the Drawings

[0006] For a more complete understanding of the present invention, reference is made to the following detailed description of the present invention considered in conjunction with the accompanying drawings, in which:

Figure 1 is an exploded perspective view of a suppository applicator constructed in accordance with a first exemplary embodiment of the present invention;
Figure 2 is a perspective view of the applicator of Figure 1 in an assembled configuration ready for use;
Figure 3 is a perspective view of the applicator of Figure 2 packaged in a blister packaging assembly;
Figure 4 is an exploded perspective view of the blister packaging assembly of Figure 3;
Figure 5 is a perspective view of the applicator of Figure 2 illustrating the dispensing of a suppository product;
Figures 6 and 7 are side elevational views of the applicator shown in Figures 1, 2 and 5, illustrating its operation;
Figure 8 is an exploded perspective view of a suppository applicator constructed in accordance with a second exemplary embodiment of the present invention;
Figure 9 is a perspective view of the applicator of Figure 8 in an assembled configuration ready for use;
Figure 10 is a perspective view of the applicator of Figure 9 packaged in a blister packaging assembly;
Figure 11 is an exploded perspective view of the blister packaging assembly of Figure 10; and
Figures 12 and 13 are side elevational views of the applicator shown in Figures 8 and 9, illustrating its operation.

Detailed Description of the Exemplary Embodiments

[0007] Referring to Figures 1, 2 and 5, there is shown a suppository applicator 10 constructed in accordance with a first embodiment of the present invention. More particularly, the applicator 10 is adapted for use in depositing an oval-shaped suppository product 12 in a

stantially identical to the width of the suppository product 12 measured along its minor axis) for purposes to be discussed hereinafter. w

[0014] With reference to Figures 2 and 5-7, the plunger member 16 is movable relative to the barrel member 14 in the axial direction between a retracted position (see Figures 2 and 6), in which the contact platform 66 is positioned adjacent the proximal end 32 of the distal section 24 of the barrel member 14, and an extended position (see Figure 5 and 7), in which the contact platform 66 is located axially outwardly from the tips 44 of the petals 38 and hence the receptacle 40. In this regard, the outer diameter of the thumb platform 58 is greater than that of the proximal section 22 of the barrel member 14 so as to prevent the plunger member 16 from moving beyond its extended position (see Figure 7). Similarly, the outer diameter of the contact platform 66 is larger than the inner diameter of the proximal end 32 of the distal section 24 such that the contact platform 66 engages an interior portion 68 (see Figure 6) of the distal section 24 located adjacent to the proximal end 32, thereby inhibiting the plunger member 16 from moving beyond its retracted position. When the plunger member 16 is positioned in its retracted position, the contact platform 66 abuts an end of the suppository product 12 (see Figure 6) so as to prevent it from being positioned too-far into the receptacle 40. More particularly, the contact platform 66 ensures that the suppository product 12 is cradled in the receptacle 40 in a preferred holding position, in which it is engaged by the distal section 24 of the barrel member 14 only at the tips 44 of the petals 38, thereby minimizing the area of contact between the suppository product 12 and the barrel member 14. In this regard, the receptacle 40 preferably has a size which is greater than that of the suppository product 12 such that the entire interior surface of the receptacle 40, with the exception of the tips 44 of the petals 38, is out of contact with the suppository product 12, whereby the suppository product 12 can be released easily from the receptacle 40.

[0015] With reference to Figures 1, 6 and 7, the annular ring 35, which is formed in the passageway 18 of the barrel member 14, is sized and shaped such that the shaft 50 movably extends through the annular ring 35. The annular ring 35 is adapted to slidably grip the shaft 50 so as to create a frictional fit between the barrel member 14 and the plunger member 16. That is, the shaft 50 is constantly engaged by the annular ring 35 throughout its movement between the extended and retracted positions and is thereby held in position by the annular ring 35. In this manner, the shaft 50 and therefore the plunger member 16 are inhibited from moving freely and causing interference during the use of the applicator 10. In an alternate embodiment, the annular ring 35 can be eliminated, thereby permitting free movement of the plunger member 16.

[0016] Referring back to Figure 1, the applicator 10 is assembled by inserting the shaft 50 into the passageway 18 through the opening 36 of the distal section 24 such that its proximal end 52 is extended outwardly from the open end 28 of the barrel member 14. The thumb platform 58 is then attached to the proximal end 52 of the shaft 50. The suppository product 12 is then inserted into the receptacle 40 of the applicator 10 for delivery into a bodily cavity.

[0017] The applicator 10 can be provided to a user without the suppository product 12 pre-installed in the receptacle 40. Alternatively, the applicator 10 can be provided to a user with the suppository product 12 pre-filled in the receptacle 40. When provided in its pre-filled form, the applicator 10 can be packaged in a blister packaging assembly 70 (see Figures 3 and 4). More particularly, the blister packaging assembly 70 includes a thermoformed, blister-type PVC (polyvinyl chloride) plastic tray 72 for receiving the pre-filled applicator 10. Alternatively, the tray 72 can be made from any other suitable materials. The tray 72 includes an outer perimeter rim 74 and a compartment 76 projecting from the rim 74. The compartment 76 includes an outer cavity section 78 for receiving the distal section 24 of the barrel member 14, including the suppository product 12 pre-installed in the receptacle 40. The compartment 76 is also equipped with an intermediate cavity section 80 for receiving the intermediate section 26 of the barrel member 14. The intermediate cavity section 80 includes a pair of side extensions 82 for receiving user's fingers during the removal of the applicator 10 from the tray 72. An intermediate cavity section 84 is also connected to the intermediate cavity section 80 for receiving the proximal section 22 of the barrel member 14, while an outer cavity section 86 is connected to the intermediate cavity section 84 for receiving the thumb platform 58 of the plunger member 16. A peelable lid 88 laminated with an aluminum foil is attached to the packaging tray 72 in a conventional manner for sealing the applicator 10 in the compartment 76.

[0018] In order to use the pre-filled applicator 10 packaged in the packaging assembly 70, the applicator 10 is removed from the packaging assembly 70. The distal section 24 of the applicator 10, together with the suppository product 12 attached thereto, is then inserted into a vaginal canal (not shown) in a conventional manner. In doing so, the barrel member 14 is gripped by the user's fingers at the ribbed surface 30 of the proximal section 22. After properly placing the distal section 24 and the suppository product 12 in the vaginal canal, the thumb platform 58 of the plunger member 16 is pushed toward the distal section 24 of the barrel member 14 so as to move the barrel member 14 from its retracted position (see Figures 2 and 6) to its extended position (see Figures 5 and 7). In this regard, the applicator 10 can be held and operated by the user in any conventional manner. For instance, with the proximal section 22 of the barrel member 14 held by the user's index and middle fingers, the thumb platform 58 of the plunger member 16 can be pushed by the user's thumb. As the plung-

er member 16 moves from its retracted position to its extended position (as indicated by the arrow in Figure 6), the contact platform 66 of the plunger member 16 pushes the suppository product 12 out of the receptacle 40. During the release of the suppository product 12 from the receptacle 40, the tips 44 of the petals 38 expand in a radially outward direction so as to facilitate the release of the suppository product 12. In order to ensure the release of the suppository product 12 from the applicator 10, the thumb platform 58 is pushed until the plunger member 16 is positioned in its extended position, in which the contact platform 66 is located axially outwardly from the receptacle 40 (see Figures 5 and 7).

[0019] After the release of the suppository product 12 from the applicator 10 into the vaginal canal, the plunger member 16 is pulled back-into its retracted position so as to place the contact platform 66 within the receptacle 40. In this manner, during the removal of the applicator 10 from the vaginal cavity, the contact platform 66 is prevented from coming in contact with tissue walls of the vaginal cavity and causing injury to same. The applicator 10 is then cleaned and disinfected for subsequent use or is discarded.

[0020] It should be appreciated that the applicator 10 of the present invention provides numerous advantages over conventional applicators. For instance, because the petals 38 of the applicator 10 have a truncated construction, they are adapted to retain the suppository product 12 in the receptacle 40, while permitting easy release of same from the receptacle 40. As a result, the suppository product 12 can be released from the applicator 10 in response to the application of an axial force that is significantly less than the force required for conventional applicators. In this manner, even if the suppository product 12 sticks to the interior surface of the receptacle 40 during its storage or insertion into a bodily cavity, it can be released from the receptacle 40 without significant difficulty. Because of its ability to release the suppository product 12 stuck to the receptacle 40, the applicator 10 can be provided to users in pre-filled and packaged form.

[0021] The oversized contact platform 66 of the plunger member 16 further ensures the proper dispensing of the suppository product 12 from the receptacle 40. For instance, because of its large size, the contact platform 66 tends to apply an axial force evenly to the suppository product 12, thereby minimizing distortion of the suppository product 12 during its release from the receptacle 40. Moreover, the contact platform 66 functions to strip the suppository product 12 off the interior surface of the receptacle 40 if there is excess friction or sticking between the suppository product 12 and the barrel member 14. In addition, because the suppository product 12 is mounted to the flaring distal section 24, the remaining sections of the barrel member 14 (i.e., the intermediate and proximal sections 26, 22) can be made relatively slender.

[0022] It should be noted that the applicator 10 of the present invention can have numerous modifications and variations. For instance, the applicator 10 can be provided with a different number of petals 38. Moreover, although the present invention is especially suitable for use in delivering suppository products to vaginal canals or cavities, it can be used to dispense suppository products or other pharmacological products in other body cavities such as a rectum. Further, the applicator 10 can be modified to accommodate suppository products having different geometrical shapes. In addition, the petals 38 can be provided with different shapes and lengths. The applicator 10 can also be packaged in different types of packages.

[0023] A second exemplary embodiment of the present invention is illustrated in Figures 8-13. Elements illustrated in Figures 8-13 which correspond to the elements described above with reference to Figures 1-7 have been designated by corresponding reference numbers increased by one hundred. Unless stated otherwise, the second exemplary embodiment of Figures 8-13 is constructed, used and operated in the same basic manner as the exemplary embodiment shown in Figures 1-7.

[0024] With reference to Figures 8, 9, 12 and 13, there is shown a suppository applicator 110 constructed in accordance with the second embodiment of the present invention. The applicator 110, which is adapted for use in delivering an oval-shaped suppository product 112 to a bodily cavity (e.g., a vaginal orifice), includes a barrel member 114 having an open proximal end 128 and an open distal end 134. Unlike the barrel member 14 of the embodiment of Figures 1-7, the entire barrel member 114 is substantially cylindrical in shape and is slightly tapered as it extends from the proximal end 128 to the distal end 134 (i.e., the diameter of the proximal end 128 is slightly greater than that of the distal end 134). As a result, the distal end 134 of the barrel member 114 is not flared. The barrel member 114 includes an interior passageway 118 extending between the proximal and distal ends 128, 134. A perimeter rim wall 190 is formed at the proximal end 128, while an annular retaining rib 192 is formed in the passageway 118 adjacent the proximal end 128. Flexible, truncated petals 138 are also formed at the distal end 134 of the barrel member 114. The petals 138 cooperate with one another so as to define a receptacle 140 for receiving the suppository product 112.

[0025] Still referring to Figures 8, 9, 12 and 13, the applicator 110 also includes a plunger member 116 having a single-piece construction. More particularly, the plunger member 116 includes a ribbed shaft 150, a proximal end 152 and a distal end 154. A thumb platform 158 is formed at the proximal end 152 for engagement with the rim wall 190 of the barrel member 114, while a contact platform 166 is formed at the distal end 154. The contact platform 166 has a diameter smaller than the inner diameter of the retaining rib 192 of the barrel member 114 such that it can be inserted into the passageway

118. The diameter of the contact platform 166 is also larger than an inner diameter D (see Figure 8) of the receptacle 140 defined by the petals 138 such that, when the contact platform 166 is positioned in the receptacle 140, it comes in contact with the petals 138 and causes same to flex radially outwardly (see Figure 13), thereby facilitating the release of the suppository product 112 from the receptacle 140. A stopping platform 194 is formed on the shaft 150 adjacent to the proximal end 152 of the shaft 150. The stopping platform 194 has a diameter slightly larger than the inner diameter of the retaining rib 192 of the barrel member 114 for purposes to be discussed hereinafter. In this regard, the stopping platform 194 is slightly flexible such that it can be inserted into the passageway 118 from the proximal end 128 of the barrel member 114 and positioned between the retaining rib 192 and the distal end 134.

[0026] The plunger member 116 is movably mounted in the passageway 118 of the barrel member 114. As a result, the plunger member 116 is movable relative to the barrel member 114 between a retracted position (see Figure 12), in which the contact platform 166 is located remote from the petals 138, and an extended position, in which the contact platform 166 is in contact with the petals 138 (see Figure 13). In this regard, the retaining rib 192 of the barrel member 114 is engageable with the stopping platform 194 of the plunger member 116 so as to inhibit the plunger member 116 from moving beyond its retracted position. Similarly, the rim wall 190 of the barrel member 114 is adapted to engage the thumb platform 158 of the plunger member 116 for the purpose of inhibiting it from moving beyond its extended position.

[0027] With reference to Figures 10 and 11, a blister packaging assembly 170 is provided for packaging the applicator 110 pre-filled with the suppository product 112. More particularly, the packaging assembly 170 has a construction basically identical to that of the blister packaging assembly 70 of the embodiment shown in Figures 1-7. For instance, the packaging assembly 170 has a tray 172 forreceiving the pre-filled applicator 110 and a peelable lid 188 attached to the tray 172.

[0028] It will be understood that the embodiments described herein are merely exemplary and that a person skilled in the art may make many variations and modifications without departing from the spirit and scope of the invention. All such variations and modifications, including those discussed above, are intended to be included within the scope of the invention.

Claims

1. A device for delivering pharmaceutical products or the like to a bodily cavity, comprising a barrel member having a distal end, which includes an opening, a plurality of petals, which extend outwardly from said distal end in a generally axial direction, and a passageway, which extends through said barrel member in a direction substantially parallel to said axial direction and which is in communication with said opening, said petals cooperating with said opening so as to form a receptacle for releasably receiving a pharmaceutical product in said distal end of said barrel member, each of said petals having a truncated flexible tip sized and shaped so as to engage a substantially central portion of the pharmaceutical product such that a large section of the pharmaceutical product extends outwardly beyond said petals so as to facilitate the release of a pharmaceutical product received in said receptacle; and a plunger member movably extending through said passageway of said barrel member for releasing a pharmaceutical product received in said receptacle, said barrel member including an engaging member positioned in said passageway for engaging said barrel member.

2. The device of Claim 1, wherein said engaging member includes a projection extending radially inwardly from said barrel member into said passageway to create a frictional fit between said barrel member and said plunger member.

3. The device of Claim 1, wherein said opening is encircled by said petals.

4. The device of Claim 3, wherein said receptacle is defined by an interior surface of said distal end and is sized and shaped such that a pharmaceutical product received in said receptacle is in contact with said interior surface only at said tips.

5. The device of Claim 4, wherein each of said petals is flexible such that said tips are expandable and contractible in a substantially radial direction.

6. The device of Claim 5, wherein said petals are sized and shaped such that an approximately half of a pharmaceutical product received in said receptacle extends outwardly beyond said tips.

7. The device of Claim 6, wherein each of said petals curves radially inwardly such that the curvature of each of said tips corresponds generally to the curvature of a substantially central portion of a pharmaceutical product received in said receptacle.

8. The device of Claim 7, wherein said petals are sized and shaped so as to receive an oval-shaped suppository product.

9. The device of Claim 1, wherein each of said petals has a length measured in said axial direction, said length being about one-half of an axial length of a pharmaceutical product received in said receptacle.

10. In combination, a pharmaceutical product; a device for delivering said pharmaceutical product to a bodily cavity, said device including a barrel member and a plunger member, said barrel member having a distal end, which includes an opening, a plurality of petals, which extend outwardly from said distal end in a generally axial direction, and a passageway, which extends through said barrel member in a direction substantially parallel to said axial direction and which is in communication with said opening, said petals cooperating with said opening so as to form a receptacle, said pharmaceutical product being releasably received in said distal end of said barrel member, each of said petals having a truncated flexible tip sized and shaped so as to engage a substantially central portion of said pharmaceutical product such that a large section of said pharmaceutical product extends outwardly beyond said petals so as to facilitate the release of said pharmaceutical product from said receptacle, said plunger member movably extending through said passageway of said barrel member for releasing said pharmaceutical product, and said barrel member including an engaging member positioned in said passageway for engaging said barrel member; and packaging means for packaging said device together with said pharmaceutical product.

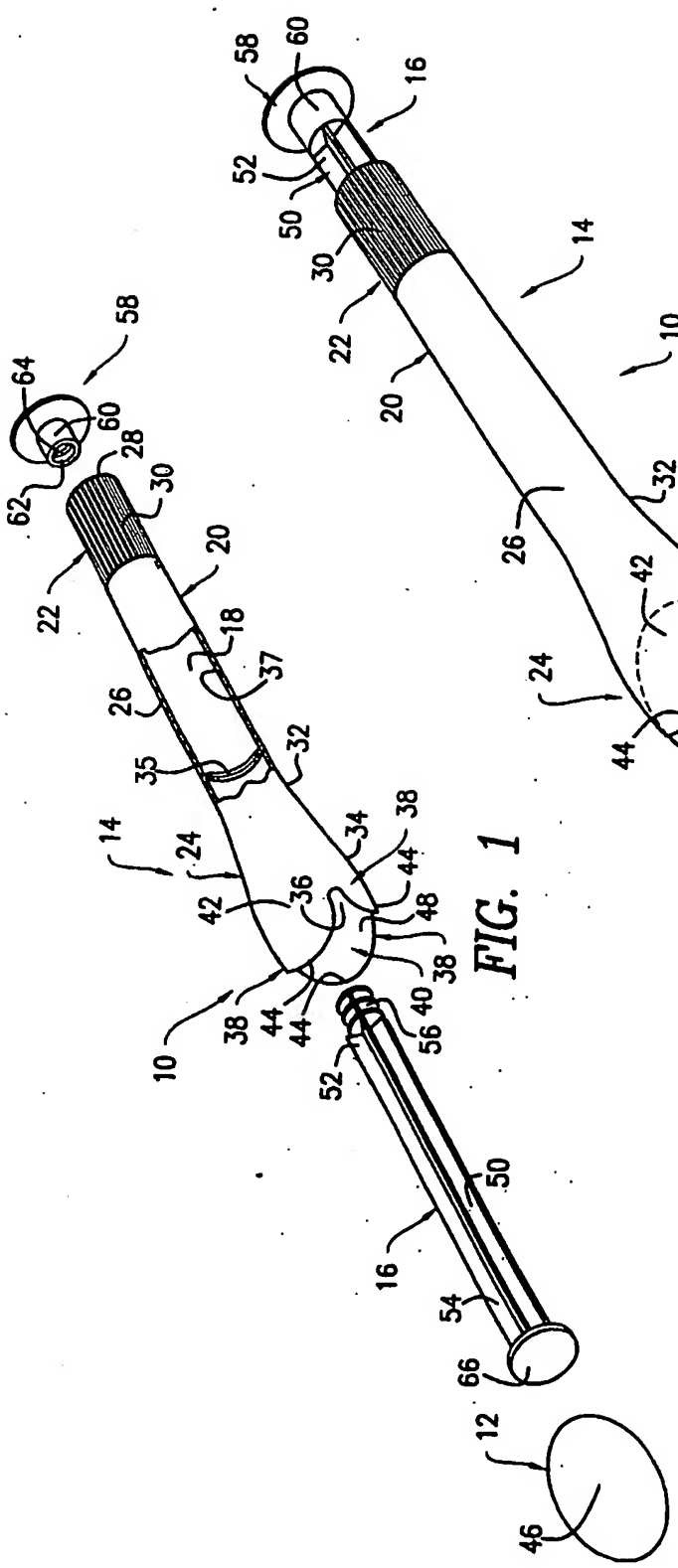
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FIG. 1

FIG. 2

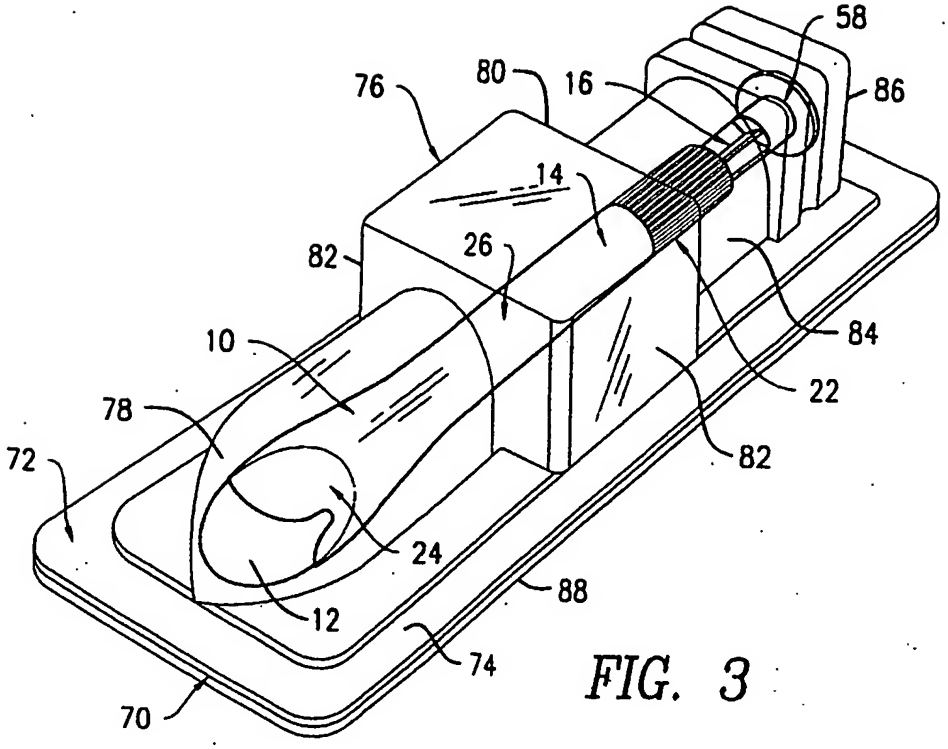
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FIG. 3

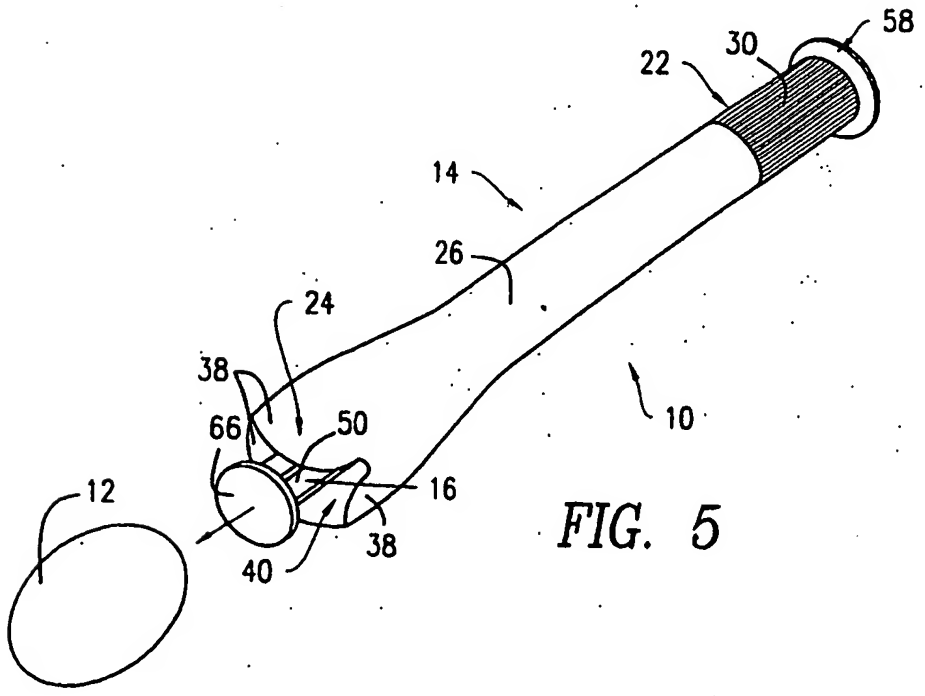
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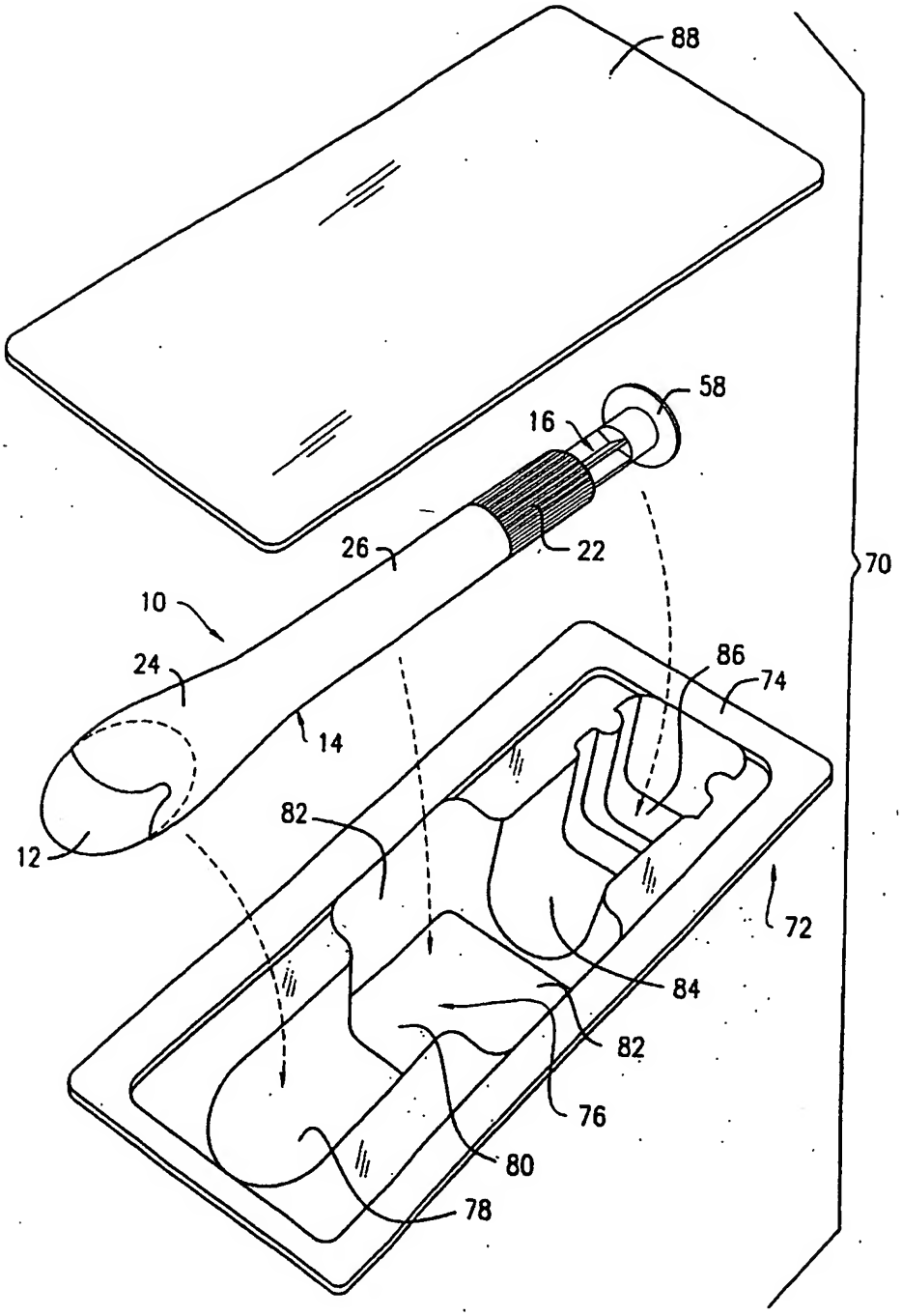
FIG. 5



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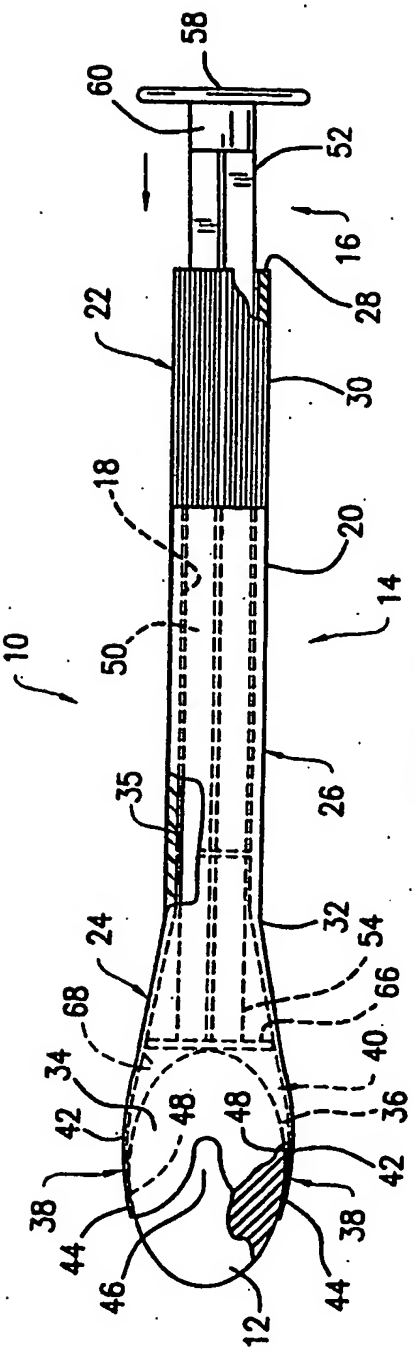
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FIG. 6

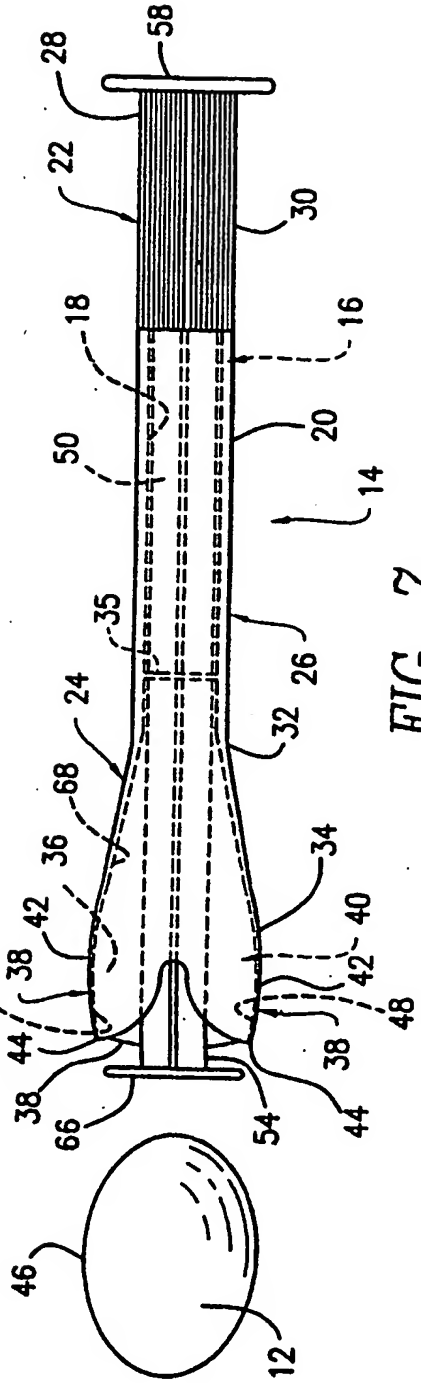
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FIG. 7

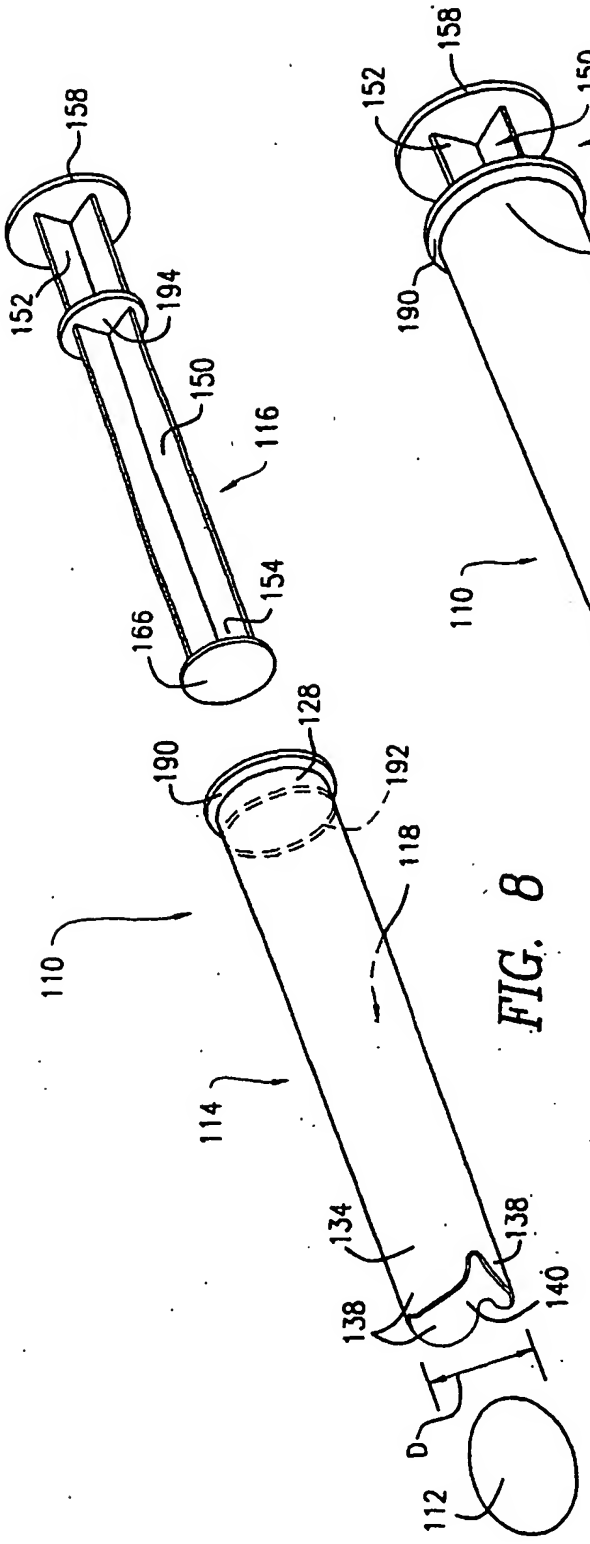
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FIG. 8

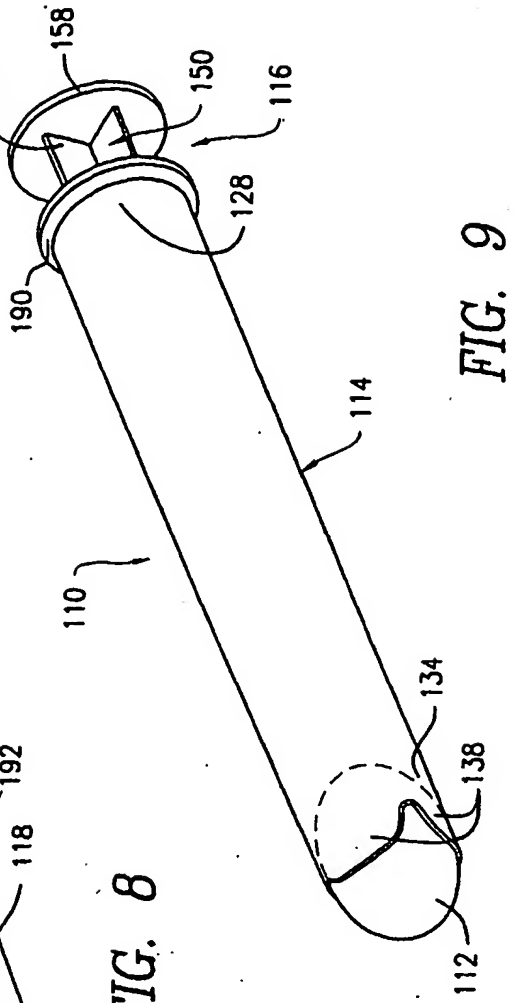
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FIG. 9

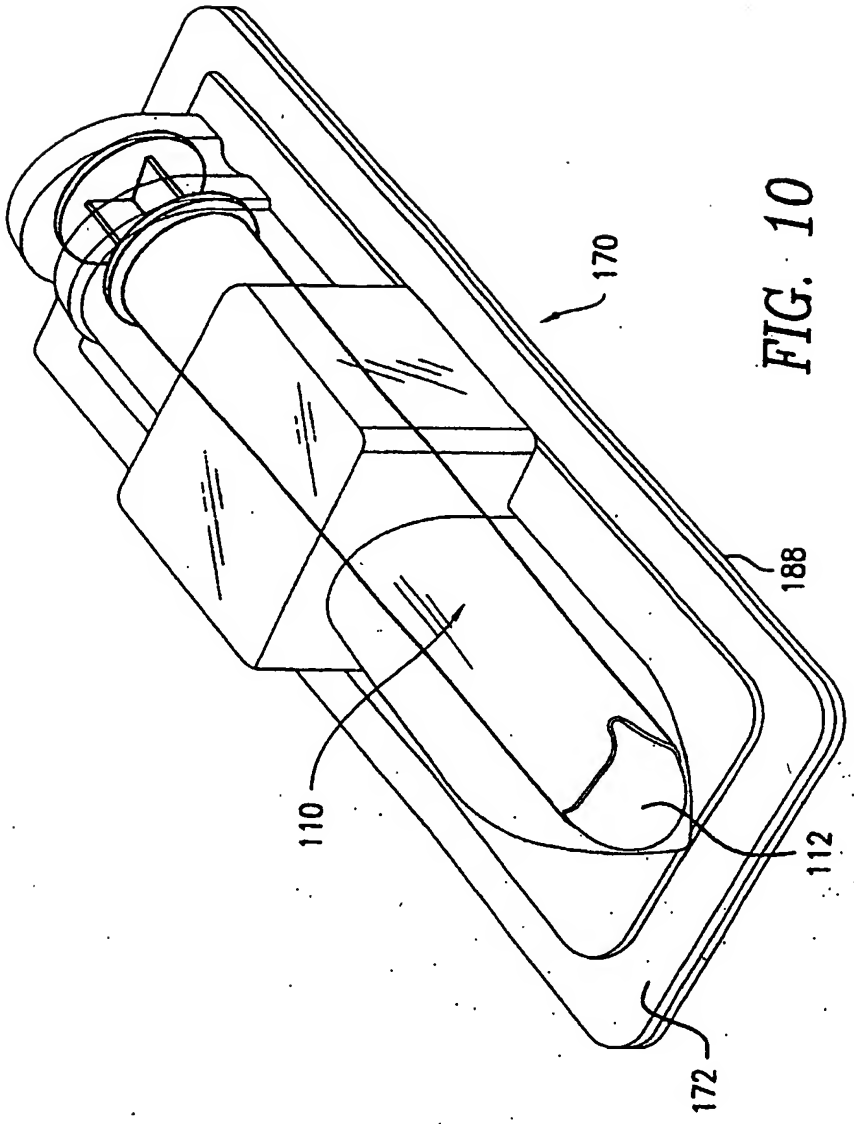

FIG. 10

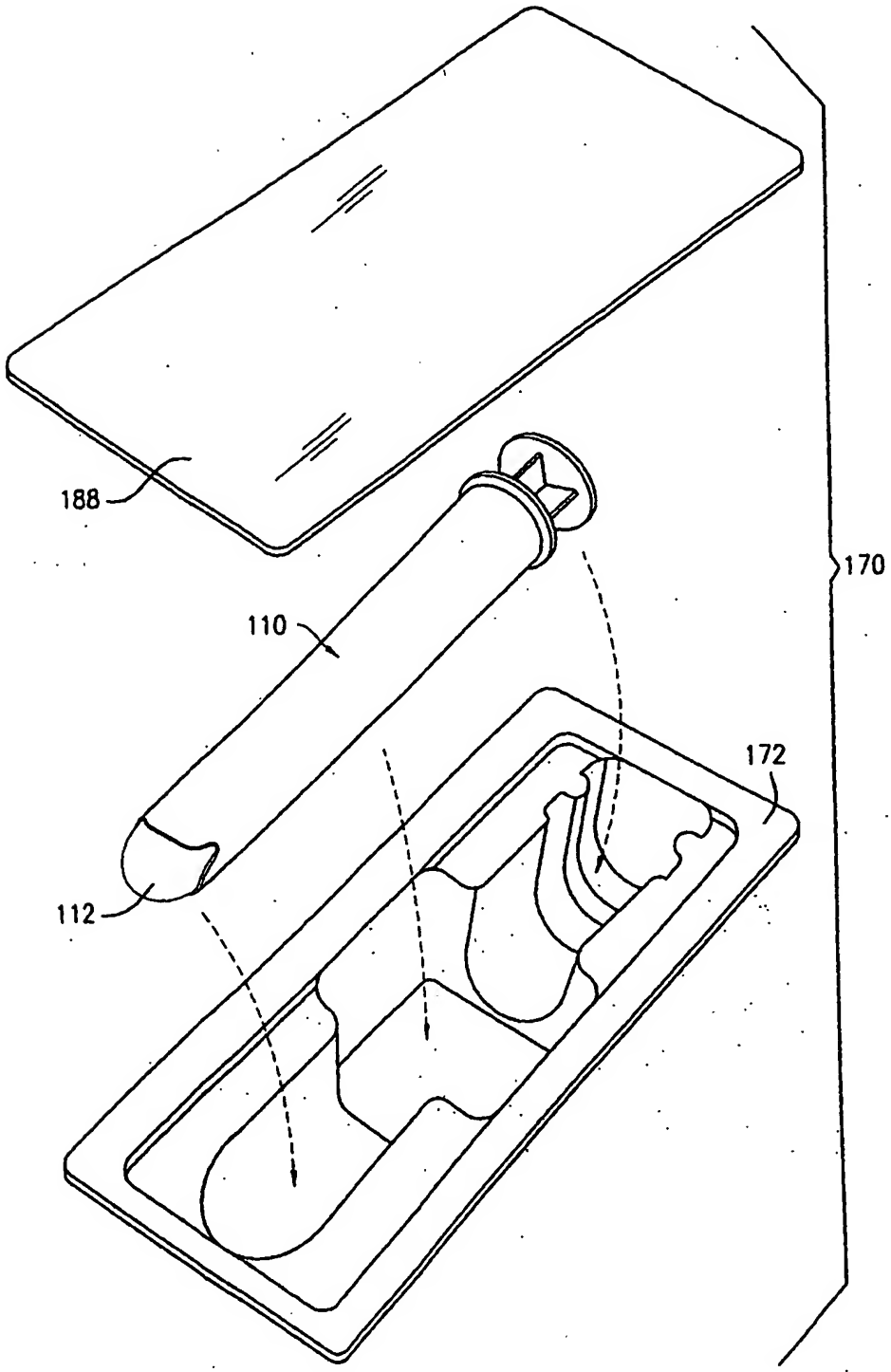

FIG. 11

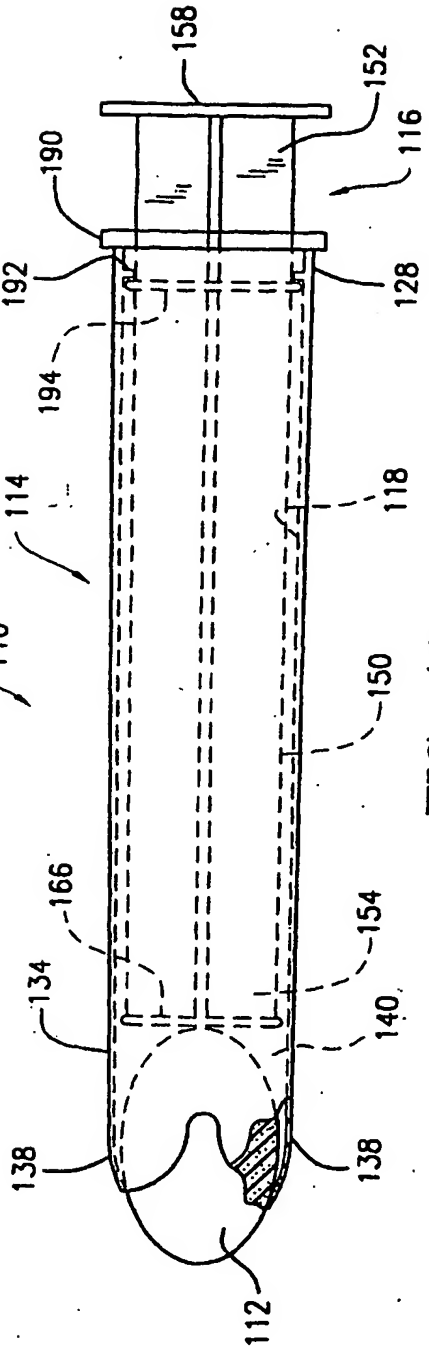
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FIG. 12

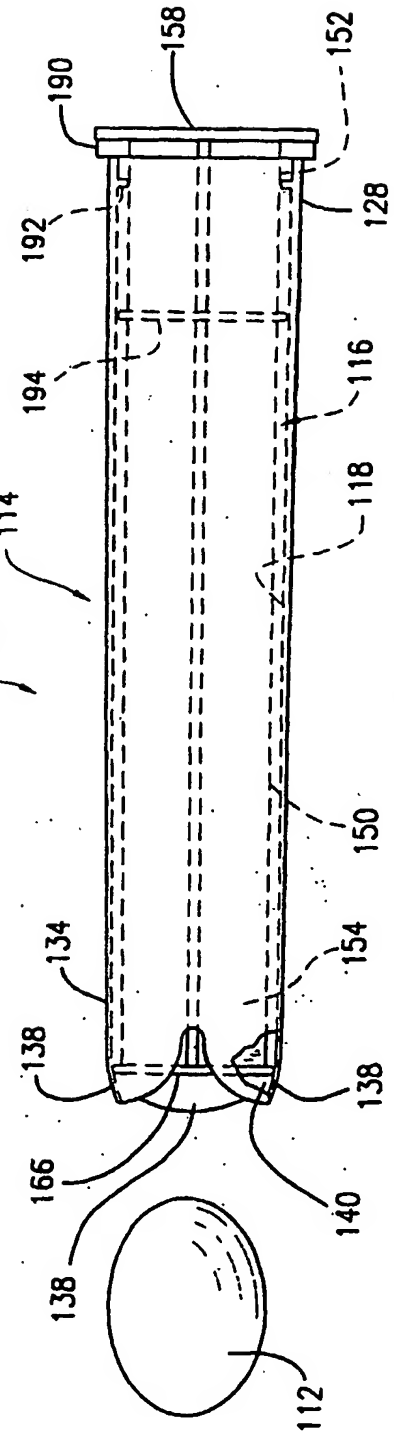
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FIG. 13

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 371 386 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
04.02.2004 Bulletin 2004/06

(51) Int Cl.[7]: **A61M 31/00**

(43) Date of publication A2:
17.12.2003 Bulletin 2003/51

(21) Application number: **03013253.4**

(22) Date of filing: **12.06.2003**

(84) Designated Contracting States:
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(54) Applicator device for suppositories and the like

(57) An applicator for delivering pharmaceutical products or the like to a bodily cavity includes a barrel member having a distal end which is equipped with an opening. The applicator also includes a plurality of petals extending outwardly from the distal end in a generally axial direction. The petals cooperate with the opening so as to form a receptacle for releasably receiving a pharmaceutical product in the distal end of the barrel member. Each of the petals has a truncated flexible tip sized and shaped so as to engage a substantially central portion of the pharmaceutical product such that a large section of the pharmaceutical product extends outwardly beyond the petals so as to facilitate the release of the pharmaceutical product from the receptacle. The device also includes a plunger member for releasing the pharmaceutical product from the receptacle. In accordance with the present invention, the device can be packaged in a package together with the pharmaceutical product received in the receptacle.

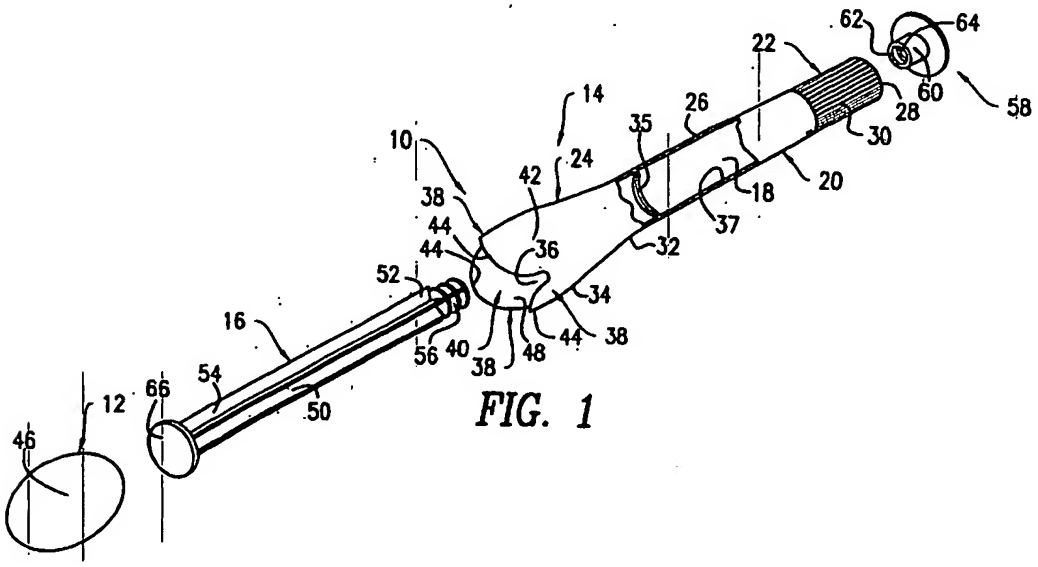

FIG. 1

EP 1 371 386 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 3253

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	12 December 2003	Kousouretas, I

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